

MinnKota Cyclone



National Weather Service

WFO Eastern ND/Grand Forks

Fall/Winter 2000

Our mission is to provide continuous hydrometeorological products and services, including accurate and timely forecasts and warnings, to the people of eastern North Dakota and northwest Minnesota.

F2 Tornado Strikes Southern Wadena County Minnesota

by Dan Riddle
Senior Meteorologist



Near Aldrich, MN, a mobile home was destroyed along with three vehicles. A resident attempts to search through the debris.

Violent thunderstorms struck eastern Otter Tail and southern Wadena counties the night of July 8th, 2000. The atmosphere was very moist and unstable over west central Minnesota ahead of an approaching front. Thunderstorms formed initially over north central Otter Tail county near Dent around 7:45 p.m. and then soon formed a line from near Sebeka to Dent by 8:10 p.m. These thunderstorms moved slowly southeast and intensified over the next 30 minutes to one hour as they moved toward New York Mills and Wadena. Doppler radar showed extreme intensity with these storms, among the most intense I have ever

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F2 Tornado Strike

National Weather Service to Hold Open House October 21, 2000

The National Weather Service in Grand Forks, North Dakota invites you to an open house at it's facility on Saturday, October 21st between 1 and 4 p.m. The office is located on 4797 Technology Circle off of University Avenue, just west of I-29.

Office staff will be on hand to display weather equipment and to discuss weather service operations. The last open house was held in 1998, and since then we have added the new Advanced Weather Interactive Processing System, **AWIPS**, computer

system which integrates satellite, radar, and forecast model data.

In addition, a drawing to give away a weather radio will be held. The weather radio is donated courtesy of the South Forks Plaza Radio Shack store in Grand Forks.

Please join us to learn more about your NWS. Call 701-772-0720 between the hours of 8 a.m. and 5 p.m. Monday-Friday for additional information or directions to our office.

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Diversity and the National Weather Service

by Dave Soroka
Meteorologist
Diversity Program Manager

Diversity is a buzzword heard often these days, but what exactly is it and how does it come into play within the National Weather Service? A definition for Diversity includes the following: a situation that includes representation of multiple groups within a prescribed environment, such as a university or workplace. An emphasis on accepting and respecting cultural differences by recognizing that no one culture is intrinsically superior to another underlies the current usage of the term.

The National Weather Service is a unique organization within the Grand Forks community, since it typically employs folks who are from all different parts of the United States. Similar to the Armed Forces, Weather Service employees are frequently transferred around the country for promotion opportunities. This creates an eclectic mix of cultural and ethnic backgrounds within each office, in addition to a myriad of personality traits and other differences including age, sex, geographic traits, sexual orientation, political inclinations, financial history, family background, etc. Because of all of these differences, the Central Region of the National Weather Service has adopted a Vision Statement on Diversity: **To promote and sustain a unified and harmonious work environment where diversity is treated as a source of strength and where every employee is valued as an equal contributor towards the accomplishment of the National Weather Service mission.**

Within this framework, each office operates a Diversity Program - lead by a Diversity Focal Point and sup-

ported by the management staff. The Diversity Program promotes and develops events with the purpose of increasing our office's understanding of one another's differences, utilizing educational and participatory programs. Our office participates in both [Ainreach@](#) and [Aoutreach@](#) activities, meaning that we explore Diversity by in-house events including self-tests, watching videos, reading articles and having ad-hoc discussions regarding people's differences, strengths and weaknesses. We also make ourselves available to community and regional events celebrating the achievements of various groups



including Women and Native Americans.

Within the past few years we have held several events at the office in the spirit of Diversity. These have included Pot-Luck Luncheons (each staff member prepares a meal native to their ethnic/cultural background), Take Your Child to Work Day and Live Video Presentations from National Diversity Experts. We have participated in the University of North Dakota's Women's History Month Programs and visited Native American Reservations in Minnesota. We have also sponsored Job Shadow Days around the Martin Lu-

ther King Holiday to introduce local students into the field of meteorology. This year we hope to expand our program by developing more in-house diversity activities and possibly invite a speaker that could address these issues to our personnel, and include staff from other local Federal Agencies. The parent organization of the NWS (NOAA - National Oceanic and Atmospheric Administration) runs a library of resources to assist each office in this regard, and we will also be utilizing this information to develop several office programs to promote the spirit of diversity.

We are a premier environmental information voice, and the NWS is united by an understanding of the interdependence of environmental, human, economic and political factors. Our ability to better cope with change and global competition is enhanced by the positive and creative power that comes from managing diversity. We cannot accomplish our primary mission of protecting life and property from severe storms, without the creative energies of all people who bring with them different approaches, solutions and innovations. We must do a better job of attracting and keeping the human potential we need to continue to accomplish our ever evolving mission. By better nurturing the fruits of diversity we will be better able to achieve the results of creativity, flexibility, and excellence. Through such an environment, we maximize the uniqueness of each employee, thereby maximizing the uniqueness of the National Weather Service. By doing this we can continue to be a premier meteorological and hydrological information voice and an employer of choice due to the value we place on our employees and our customers.

The Region's Worst Blizzard Ever The "Ides of March Blizzard" March 15, 1941

According to the climate record, our region can expect to have 2 to 3 blizzards each winter. Each blizzard is different in magnitude and duration. Some blizzards come with a certain swiftness, large temperature change, and long duration that make them very dangerous. The blizzard that hit on Saturday evening, March 15, 1941, was one such blizzard. In its wake, the storm claimed 72 lives - the most ever for our region.

Much of the detailed account of this blizzard has been documented in the fascinating book entitled *Looking for Candles in the Window* by Douglas Ramsey and Larry Skroch. Their book describes the social events that were taking place across the region the night the blizzard struck. It's a great historical account of the weather event and how people both survived and tragically died in the storm. It also provides an account of how weather forecasts were prepared and disseminated.

One interesting aspect of the storm was how people received weather warnings and how weather forecasts were made in 1941. By today's standards, forecasting methods were very crude. There was no Doppler radar, weather satellites, or super computers to help in the detection and analysis of weather. Instead, forecasters relayed on information from hourly surface weather reports and weather balloon observation reports taken twice daily. Weather forecasts for the Northern Plains were prepared at the forecast office in Chicago, Illinois! In 1941, the forecast prepared was for the entire state of North Dakota or Minnesota, rather than by county as

they are prepared today.

Information in 1941 was distributed primarily through newspapers and radio. Weather warnings were disseminated exclusively via commercial radio stations. The U.S. Weather Bureau (as the National Weather Service was called prior to 1970) would have notified local radio stations of a warning (usually by telephone), then broadcasters would relay the message to the public. In 1941, there was no network of NOAA Weather Radios across the county that would automatically tone-alert citizens of an impending storm. It was 55 years before the development of the Emergency Alert

**"The 1941 "Ides of March"
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System (EAS), which allows National Weather Service to broadcast weather warnings directly over commercial radio and television. Indeed dissemination was slow by today's standards; however, since most people in 1941 relied on the radio for information once a warning was broadcast on radio, the news would travel throughout the community fairly quickly.

Unfortunately, limitations in weather forecasting provided for little or no advanced warning. The weather forecast for the entire state of North Dakota prior to the storm read "occasional light snow tonight and Sunday; cold wave with strong northwest winds tonight and Sunday."

Specific details about wind speeds, snowfall amounts and visibil-

ity were unavailable in 1941. Today, with a NWS forecast office in Grand Forks and a cadre of meteorologists armed with Doppler Radar, satellite technology, and computer models of the atmosphere, it is highly unlikely a blizzard of this magnitude would go completely unforecast.

The 1941 Ides of March blizzard was most noteworthy due to the swiftness at which it struck. Much of the snow cover had melted prior to the storm. Temperatures were near 30 when a light snow began to fall. After approximately 2 hours of fluffy big snowflakes with little wind, the blizzard struck with the fury of a rapidly moving freight train. Hurricane force winds were experienced (Grand Forks had a peak gust of 85 MPH). Due to the strong winds and light snow cover prior to the blizzard many reported dirt mixed in with the snow. This may have contributed to the suffocation of victims who were lost outside in the blizzard, hopelessly trying to find shelter in visibility that could be measured in mere inches. Plummeting temperatures didn't help much either as temperatures fell to 10 below by Sunday morning with wind chills in the deadly category.

History reveals that storms of this magnitude will eventually return to our region. Modern forecasting techniques and technological improvements at the NWS will help keep people informed before the next severe blizzard strikes. Although early warnings are necessary, it's vital for everyone to take preventative action when a storm is forecast to occur.

Winter Weather Survival

For many people, last winter was a welcome break from the typically harsh weather that we experience. However, this year we may not be so fortunate. Even long-time residents to our area need a yearly reminder of winter safety rules for survival. Remember, everyone is potentially at risk during winter storms. The actual threat depends on your specific situation. Recent observations indicate the following about winter weather fatalities:

Related to snow and ice:

- About 70% occur in automobiles
- About 25% are people caught out in the storm
- Majority are males over 40 years old

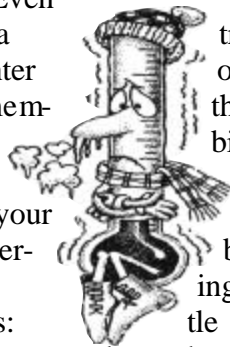
Related to exposure to cold:

- 50% are people over 60 years old
- Over 75% are males
- About 20% occur in the home

Winter storms are considered deceptive killers because most deaths are indirectly related to the storm. For instance, people die in traffic accidents on icy roads, from heart attacks while shoveling snow, or from hypothermia due to prolonged exposure to the cold.

When caught outside in a winter storm, it is very important to stay dry, covering all exposed parts of your body. If shelter is unavailable, try to get behind a wind

break. Snow is an insulator, therefore, burrowing into a deep snow bank can provide some shelter and warmth to the stranded.



If caught in a car or truck during a blizzard, one should never leave the shelter of an automobile. Run the motor at ten minute intervals for heat. To avoid carbon monoxide poisoning open the window a little for fresh air and keep the exhaust pipe clear. When travelling during the snow season, always include a survival kit. This would include at a minimum; blankets, non-perishable food, a shovel, and a small can with waterproof matches to melt snow for drinking water.

When dressing for the cold, wear layers of loose-fitting, lightweight, warm clothing. If necessary, remove layers to avoid overheating, perspiration, and subsequent chill. Wear a hat, because half your body heat loss can be from your head. Cover your mouth to protect your lungs from the extreme cold. Mittens, snug at the wrist, are better than gloves.

Drinking alcohol and venturing out in winter storms don't mix. Several fatalities in our region last year were attributed to intoxicated citizens heading out into the storm. Not only does alcohol impair your judgement but it can restrict your resistance to the cold.

The best way of tracking a storm is by listening to Weather

Radio, commercial radio, and television for the latest watches, warnings and advisories. The following are terms you will hear this winter:

Winter Storm Watch: Severe winter conditions, such as heavy snow and/or ice, are possible within the next day or so.

Winter Storm Warning: Severe winter conditions have begun or are about to begin in your area. Warnings are also issued for wind chill. Stay indoors!

Blizzard Warning: Snow and strong winds combine to produce a blinding snow, deep drifts, and life-threatening wind chill. Seek refuge immediately!

Winter Weather Advisory: Winter weather conditions are expected to cause significant inconveniences and may be hazardous. If caution is advised, these situations should not become life threatening. The greatest hazard is to motorists. Advisories are issued for snow, blowing snow, wind chill, and freezing rain.



What's in a Name??

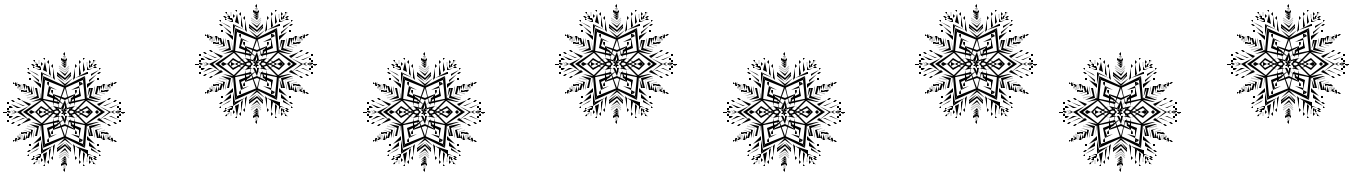
There are all kinds of different names for storms - Alberta Clipper, Colorado Low, or Nor-easter. They are names that were developed based on the location where the storms originated. A Nor-easter, which is associated with storms that track along the mid-Atlantic and Northeast Coast of the United States, refers to the biting wind that typically blows from the northeast during the onslaught of a major cyclone.

For hurricanes, you have all kinds of names, for both men and women. Of course if one of those names is associated with a destructive storm, then it's retired. Agnes, Andrew, Camille, and Hugo fit into that category. Mentioning these names will forever invoke fear for the people who have experienced their fury firsthand.

Large and destructive tornadoes are also named, usually after the town they've ravaged. Mention the Andover Tornado in Kansas, the Charles City Tornado in Iowa, or the Xenia Tornado in Ohio and you'll get a response from folks who live in those areas. This occurs even if the tornado occurred several decades ago. People who did not live in the area at the time, or were not yet born, usually become acquainted with the history of such storms by talking to long-time residents.

In our part of the country some folks have taken up naming blizzards. *The Grand Forks Herald* names blizzards each year. Probably the most famous was Blizzard AHannah that struck the region in April 1997. It helps us recall the harsh event. That winter was especially tough with enough blizzards to reach the letter H.

The National Weather Service officially names hurricanes only. This is because hurricanes produce a very specific type of weather (damaging wind and heavy rain), are long lived (for many days), and occur over large areas (thousands of miles). Naming tornadoes is difficult because they occur quickly over a small area. In addition the meteorological conditions that lead to their formation can vary. It's similar with blizzards. Some may occur because the snow on the ground is fluffy, the wind is strong with no falling snow and no real low pressure system. Some cyclones may produce blizzard conditions over just a small area of North Dakota, tornadoes in Iowa, ice in Minnesota, beneficial rainfall for Michigan, and pleasant record high temperatures in Indiana, all occurring simultaneously. Therefore, naming blizzards, tornadoes, or floods may work best if derived locally, rather than nationally, because totally different types of weather can be experienced from the same cyclone.



Winter 2000 Outlook

By Mark Ewens
Data Acquisition Program Manager

The Pacific Ocean is warming, the sun is getting noisier, and the trade winds near the equator at 100,000 feet are blowing from the east. Then there is the Pacific Decadal Oscillation, the North Atlantic Oscillation; many cycles in the atmosphere just being analyzed by scientists. What does this all mean for weather across the northern plains? Well, the last 2 winters have proven to be quite different with similar conditions; the

winter of 1998/1999 was mild and somewhat wet while the 1999/2000 winter was very warm with very little snowfall. The winter of 1999/2000 outlook from many organizations – including the National Weather Service – were for a cold and wet winter. This simply goes to show that climate is what you expect and weather is what you get.

Based on the trends in the electric field data for the last year, the experimental electric field based weather outlook for the 2000/2001 winter is a mild, but slightly wetter

than normal, winter. Although preliminary, the first outlook is for temperatures to average 1 to 4 degrees above normal, with 40 to 60 inches of snow. Admittedly, last year's outlook was a bust, but remember: No one fools Mother Nature!

(R)
Near Aldrich, MN. Two people in the mobile home were injured, sustaining cuts and bruises.

A preliminary damage estimate is \$250,000.



(continued from page 1)

seen, with large hail and strong rotation. One storm moved just southwest of New York Mills dropping 3 to 4.5 inch hail between 8:45 p.m. and 9 p.m. Fortunately, this storm did not drop a tornado, but the hail caused considerable damage to crops and roofs. The folks in southern Wadena county were not so fortunate. Another storm intensified just southeast of Wadena around 9 p.m. with radar indicating strong rotation around 9:15 p.m. A tornado warning was issued at 9:16 p.m. for southern Wadena county. A storm survey was conducted the next day by the National Weather Service in

Grand Forks and the Wadena county Emergency manager Wayne Terry. An F1 tornado touchdown was confirmed near Verndale at 9:25 p.m. and then continued on an east-southeast path to near Aldrich, where it intensified to an F2 on the Fujita scale with winds speeds estimated around 115 mph. Near Aldrich, a mobile home was destroyed along with three vehicles. Two people in the mobile home were injured, sustaining cuts and bruises. The tornado continued southeast and hit the west side of Staples around 9:43 p.m., damaging roofs and uprooting trees. A preliminary damage estimate is \$250,000.

Damaging Winds Hit Devils Lake, ND in August

by Dan Riddle
Senior Meteorologist

A line of severe thunderstorms formed the evening of August 11th, 2000 across western North Dakota and eastern Montana. These storms moved rapidly east and reached the Devils Lake area just after midnight producing very strong and damaging winds. A wind gust of 111 mph was recorded at the Devils Lake Law Enforcement Center at 1:09 a.m., August 12th. Several buildings were damaged or destroyed in the city of Devils Lake with numerous trees uprooted. Several mobile homes were damaged

and one was rolled on its top by the wind. There were two injuries, one severe. A storage unit was ripped apart by the wind and thrown 150 feet onto a passing motor vehicle, severely injuring the driver. Debris from a roof injured a pedestrian. Preliminary damage estimates exceed \$1 million.

These storms continued to move east and weakened overnight. But not before producing 80 mph winds at the air station in Concrete, North Dakota at 1:35 a.m. and 58 mph winds at Hallock, Minnesota at 2:13 a.m.

Ole in Grand Forks

By Dave Kellenbenz
Meteorologist

You may have heard him on National Weather Service radio broadcasts, or perhaps a friend told you about him. This guy is called Ole, and he works tirelessly broadcasting weather to Eastern North Dakota and north-west Minnesota. Truthfully Ole is actually a computer generated voice who reads forecast products on the weather radio each and every day. One may ask, how can a computer do this ? I will try to answer this and other questions as we explore the life of Ole.

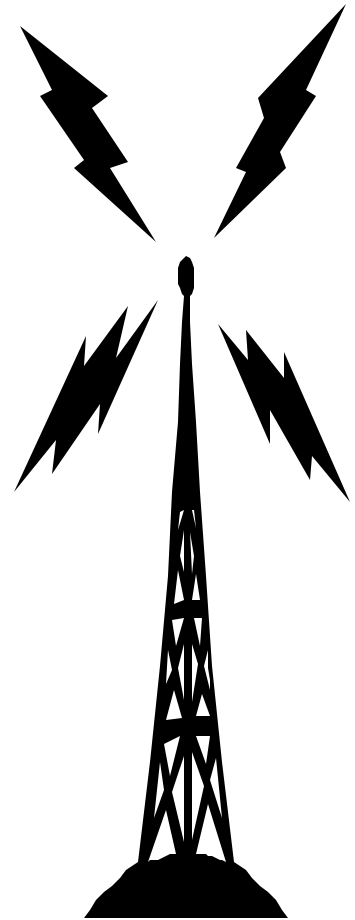
Ole came to the office during the early part of 1998, and was fully operational by May 1998. There were quite a few growing pains when he first was introduced onto the scene. Many things had to be done by the staff to make it possible for Ole to broadcast the weather. The computer systems had to be manipulated so that when Ole received a weather product, he would be able to then read it on the air. It was discovered that Ole would need a computer to properly format products, so he could then understand them. This computer system was called AIRWAVE. AIRWAVE was designed to take products issued from the NWS in Grand Forks, then remove any information which Ole didn't need or understand. Once this was completed, Ole would then receive, for instance, a forecast for the area, then read it on air.

It is easy for one to see just how complex a procedure such as this is. Therefore, it has taken

quite a while to perfect this process. In the beginning, Ole would receive information which he could not understand, and then would reject it. As time has passed, AIRWAVE and OLE have become the best of friends, and can communicate almost without any effort. There are still some quarrels now and then, and times when information is not passed along correctly. No system is perfect though, but now only minimal human intervention is needed on a routine basis.

Before the days of Ole, all products had to be manually read on the weather radio by a human. This took considerable time away from the forecast environment. Now with Ole doing all routine weather broadcasts, a lot more time is available for more forecasting and extra-curricular activities. During severe weather watches and warnings, a human voice is used because Ole has not yet perfected this art.

Ole is being upgraded and improved on a monthly basis, with new and improved dictionaries and internal parts. In addition, he has been attending speech class, and a new and improved concatenated voice is planned to be installed by September 2001. This will greatly improve the voice quality of Ole, and make him sound more human. One may ask, how can I hear Ole ? The only thing you have to do is purchase a NOAA weather radio at Radio Shack or Walmart. These are relatively inexpensive, and can range in price from 30 to around 70 dollars, depending on the model. These broadcast all



weather warning, watches, forecasts 24 hours a day, seven days a week. Feel free to let us know how Ole sounds, and if there is anything we can do to improve upon his broadcasts. Send comments to David.Kellenbenz@noaa.gov.

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National Weather Service

We're on the web!
[Http://www.crh.noaa.gov/fgf](http://www.crh.noaa.gov/fgf)

Improvement in Long Range Forecasting

By Pete Berg
Senior Meteorologist

Through the long history of weather, one of the major goals that has been addressed by meteorologists was how to improve the accuracy in long range forecasting. With this feat, the general public and agricultural communities would get a heads up on the weather well in advance and would be able to plan their schedules accordingly to prevent any major financial setback.

During the past decade many encouraging results have surfaced on the horizon with respect to the art of long range forecasting. This improvement basically can be attributed to more sophisticated computer models, better and higher resolution satellite imagery and the incorporation of the Climate Prediction Cen-

ter as a branch of the National Weather Service. With these tools, meteorologists can now study weather phenomena such as upper level jet stream configurations (steering mechanism for overall weather systems), Hovmoller Diagram (two dimensional plot of 500 millibar height fields at 40N latitude across the Northern Hemisphere) to help detect and predict weather system migration . Probably most noted during the past decade has been the study of ocean temperature fluctuations. These temperature trends have aided forecasters in the early detection and warning of impending El-Nino (warmer and drier winter conditions across the Northern Plains) and La-Nina (cooler and wetter conditions across the Northern Plains.)

With the arrival of the new millennium one can only expect continued advancement in all facets of meteorology and computer technology. Hopefully, sometime soon you or myself could plan an outing two weeks in advance with the complete confidence that nothing will go wrong in the weather department.